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Terms	Documents
L30 and (controller or microprocessor or processor)	6

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L31 and digital with signal with
processor

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L48: Entry 1 of 1

File: USPT

Sep 4, 2001

DOCUMENT-IDENTIFIER: US 6286063 B1

TITLE: Microprocessor-controlled broadcast receiver embedded in an external peripheral with digital communications interface for bi-directional communication with a computer remotely located

Detailed Description Text (22):

Numerous variations on the preferred embodiment and alternate embodiments of the invention are possible. For example, the broadcast receiver circuit 6, microcontroller with integrated digital communications interface 7, and/or amplifier circuit 8 may be located in either satellite stereo speaker 3 or 4 instead of in sub-woofer 2. In another variation, the control signals transmitted from the microprocessor 14 to the microcontroller with integrated digital communications interface 7 may not need further processing and/or formatting by the microcontroller with integrated digital communications interface 7 before being forwarded to the broadcast receiver circuit 6. In another variation, the broadcast receiver circuit 6, microcontroller with integrated digital communications interface 7, and/or amplifier circuit 8 may be located in an alternate external computer peripheral, such as a mouse (or other pointing device), joystick, or keyboard, that is connected to the personal computer 11 via a digital communications link. In another variation, the microcontroller with integrated digital communications interface 7 may be replaced by a separate microcontroller and a separate digital communications interface (as opposed to a single component or circuit with both functions). In another variation, the functionality of the broadcast receiver circuit 6 is provided by a single broadcast receiver chip. In yet another variation, a hybrid chip provides the functionality of the broadcast receiver circuit 6 as well as the functionality of the microcontroller with integrated digital communications interface 7.

Detailed Description Text (29):

The output of the fixed mixer 44 is the output of the RF front end circuitry 41. The analog signals that are the output of the RF front end circuitry 41 are at IF 46. The RF front end circuitry 41 is connected to the USB codec 48. The USB codec 48 includes an analog-to-digital converter 47 (A/D), a digital signal processor (DSP) 49, and a USB microcontroller 50. The analog-to-digital converter 47 is connected to the fixed mixer 44 and to the DSP 49. The DSP 49 is connected to the USB microcontroller 50. The analog-to-digital converter 47 receives a filtered analog signal from the RF front end 41, and more specifically, from the fixed mixer 44. The analog-to-digital converter 47 converts the filtered analog signal (at intermediate frequency 46) to digital representation of that signal. The digital signal that forms the output of the analog-to-digital converter 47 is passed to the DSP 49. The DSP 49 processes the digital signal. Data extraction is performed by the DSP 49 on the digital signal, extracting the data components (datacasting information) the digital audio components, and/or the analog audio components of the signal received by the antennae 10 and filtered by the RF front end 41. The output of the analog-to-digital converter 47 and the output of the DSP 49 can be 16- or 32-bits wide. The digital components extracted by the DSP 49, or the digital components of the original broadcast signal received by the antennae 10, are passed to the USB microcontroller 50. The USB microcontroller 50 formats the extracted digital component(s) for transmission to the personal computer 11 via the digital communications link 12. Because the digital communications link 12 is preferably a USB link, the USB microcontroller 50 formats the extracted digital component(s) for

transmission via a USB link. However, if the digital communications link 12 is an alternate digital link (other than USB) the USB microcontroller 50 formats the extracted digital component(s) for transmission in the specific format of the chosen digital communications link.

Detailed Description Text (30):

The DSP 49 extracts and demodulates the analog component(s) of the original broadcast signal. The analog component(s) extracted and demodulated by the DSP 49, or the filtered and mixed analog component(s) of the original broadcast signal received by the antennae 10, is passed to the digital-to-analog converter 53. The digital-to-analog converter 53 is connected to the DSP 49 and may optionally be included in the USB codec 48 or it may be a separate component. The output 51 of the digital-to-analog converter 53 may be passed to the amplifier circuit 8 (shown in FIGS. 1-5 and 7) for amplification and output to the user. Alternately, the analog output 51 of the digital-to-analog converter 53 may be passed to a sound card, optionally present in the personal computer, via an analog link.

Detailed Description Text (33):

In a variation of the embodiment shown in FIG. 6, the USB codec may not have a DSP 49. In this variation, the analog-to-digital converter 47 is connected to the USB microcontroller 50. The USB microcontroller 50 formats the digitized signal that is the output of the analog-to-digital converter 49 and transmits the digitized signal to the personal computer 11 via the digital communications link 12. The microprocessor 5 of the personal computer 11 processes the digitized signal and performs data extraction on the digitized signal, extracting the data components of the signal received by the antennae 10 and filtered by RF front end 41. In this variation, firewire (IEEE-1394) is preferred as the digital communications link 12 because of its increased band width.

Detailed Description Text (35):

The broadcast receiver circuit 6 is connected to the USB codec 48. The received broadcast signal is passed from the broadcast receiver circuit 6 to the USB codec 48. The USB codec 48 performs data and audio extraction. The USB codec 48 also formats data for transmission over the digital communications link 12 to the personal computer 11. The USB codec 48 data and audio extraction function requires a "key" to be able to extract the data and audio. The extraction algorithm executes on the DSP inside the USB codec 48 and requires at least one constant (or "key") to be able to extract data and audio from the broadcast signal.

Detailed Description Text (39):

The personal computer 11 transmits the received key to the USB codec 48 via the digital communications link 12. The DSP inside the USB codec 48 may then use the received key to decode the received broadcast signals. Any encryption algorithm that makes use of a key may be used.

Detailed Description Text (40):

The data portion of the broadcast signal may be encoded, the audio portion may be encoded, or both may be encoded. The encryption algorithm must decode the signal and then the DSP 49 inside the USB codec 48 must extract the audio and data portions of the signal. The DSP 49 must demodulate the analog audio portion and pass the demodulated signal through the digital-to-analog converter 53 before it is passed to the amplifier circuit 8, or alternatively, to a sound card 19 (shown in FIG. 2) within the personal computer 11 via the analog link 22 (shown in FIG. 2). The digital or the data portion of the decoded signal is passed to the personal computer 11 via the digital communications link 12 for processing or storage.

Detailed Description Text (41):

Alternatively, after receiving payment information, the broadcaster (not shown) may send a key to the personal computer via the data portion of a broadcast signal such as IBOC or Eureka-147. If the user (not shown) does not have access to an external data connection (such as the internet), this option allows the user to purchase a key via the telephone or mail and then receive the key via the broadcast signal. In this case, the USB codec 48 extracts the data portion of the received broadcast signal. The key is in the data portion of the broadcast signal. Either the DSP 49 or the USB microcontroller 50 must check the ID accompanying the key (also sent via the

data portion of the broadcast signal). If the ID matches the ID of the receiver (stored in a register or memory) associated with the USB codec 48, the USB codec 48 sends a control signal to the personal computer 11 via the digital communications link 12. This control signal activates the user interface (not shown) of the personal computer 11 and allows the user (not shown) to control the broadcast receiver (change the turning frequency, store received data, etc.).

Set Name Query

side by side

Hit Count Set Name

result set

DB=USPT; PLUR=YES; OP=OR

<u>L31</u>	L30 and (controller or microprocessor or processor)	6	<u>L31</u>
<u>L30</u>	mouse with optical with sensor and ADC	6	<u>L30</u>
<u>L29</u>	L28 and ADC	1	<u>L29</u>
<u>L28</u>	L26 and substrate	36	<u>L28</u>
<u>L27</u>	L26 and unitary with substrate	0	<u>L27</u>
<u>L26</u>	mouse with optical and integrated with circuit	223	<u>L26</u>
<u>L25</u>	((345/\$3).ccls.) and mouse with optic\$3 and substrate and sensor and ADC and microprocessor	1	<u>L25</u>
<u>L24</u>	L23 and hardware with control\$3	0	<u>L24</u>
<u>L23</u>	L22 and memory	3	<u>L23</u>
<u>L22</u>	L21 and substrate	3	<u>L22</u>
<u>L21</u>	L20 and (controller or microcontroller or processor)	10	<u>L21</u>
<u>L20</u>	L19 and sensor	13	<u>L20</u>
<u>L19</u>	L18 and (ADC or converter)	20	<u>L19</u>
<u>L18</u>	L17 and optical	94	<u>L18</u>
<u>L17</u>	((345/166)!.CCLS.) and mouse	112	<u>L17</u>
<u>L16</u>	L13 and (touchpanel or touchpad or digitizer)	1	<u>L16</u>
<u>L15</u>	L13 and touchpanel	0	<u>L15</u>
<u>L14</u>	L13 and coordinat\$3	1	<u>L14</u>
<u>L13</u>	L12 and scroll\$3	2	<u>L13</u>
<u>L12</u>	L11 and switch\$3	9	<u>L12</u>
<u>L11</u>	L10 and cursor	12	<u>L11</u>
<u>L10</u>	ali same zamani	63	<u>L10</u>
<u>L9</u>	L8 and scroll	4	<u>L9</u>
<u>L8</u>	L7 and coordinate	9	<u>L8</u>
<u>L7</u>	L6 and on/off	15	<u>L7</u>
<u>L6</u>	touch with panel and cursor with control\$ and key with switch\$	84	<u>L6</u>
<u>L5</u>	touch withpanel and cursor with control\$ and key with switch\$	102263	<u>L5</u>
<u>L4</u>	touchpanel with cursor with control\$ and key with switch\$	0	<u>L4</u>
<u>L3</u>	touch panel with cursor with control\$ and key with switch\$	102311	<u>L3</u>
<u>L2</u>	L1 and (keys or switches)	2	<u>L2</u>
<u>L1</u>	5677711	3	<u>L1</u>

END OF SEARCH HISTORY

Set Name Query

side by side

Hit Count Set Name

result set

DB=USPT; PLUR=YES; OP=OR

<u>L24</u>	L23 and (controller or microcontroller or processor)	3	<u>L24</u>
<u>L23</u>	L22 and sensor	3	<u>L23</u>
<u>L22</u>	L20 and converter	3	<u>L22</u>
<u>L21</u>	L20 and ADC	0	<u>L21</u>
<u>L20</u>	L19 and substrate	18	<u>L20</u>
<u>L19</u>	L18 and optical	92	<u>L19</u>
<u>L18</u>	((345/166)!.CCLS.) and mouse	110	<u>L18</u>
<u>L17</u>	L16 and ADC	0	<u>L17</u>
<u>L16</u>	L15 and microprocessor	4	<u>L16</u>
<u>L15</u>	L14 and sensor	20	<u>L15</u>
<u>L14</u>	mouse with substrate and optical	374	<u>L14</u>
<u>L13</u>	((345/\$3).ccls.) and mouse with optical and sensor and ADC and microprocessor	14	<u>L13</u>
<u>L12</u>	Alexnder same Eisen	0	<u>L12</u>
<u>L11</u>	Alex same Eisen	0	<u>L11</u>
<u>L10</u>	alex same eisen	0	<u>L10</u>
<u>L9</u>	vanel same frenel	71	<u>L9</u>
<u>L8</u>	ali same zamani	60	<u>L8</u>
<u>L7</u>	L5 and period	23	<u>L7</u>
<u>L6</u>	L5 and subfield	0	<u>L6</u>
<u>L5</u>	((345/88)!.CCLS.) and LCD with (RGB or red, blue, green)	48	<u>L5</u>
<u>L4</u>	L3 and subfield	0	<u>L4</u>
<u>L3</u>	5731794	4	<u>L3</u>
<u>L2</u>	((345/\$3).ccls.) and LCD with light with source and (RGB) and subfield	1	<u>L2</u>
<u>L1</u>	((345/\$3).ccls.) and LCD with light with source and (RGB) with subfield	0	<u>L1</u>

END OF SEARCH HISTORY